TITLE: AUTOMATED CONTENT INTEGRITY VALIDATION FOR STREAMING DATA
INVENTOR(S): GREGORY C. KIME ET AL.
APPLICATION NO.: 10/038,023

1/6

100

102

LIVE
FEED

ON DEMAND

SERVER

FINGERPRINT BLOCK
GENERATOR — 120

106

GLOBAL LOAD BALANCER — 112

DISTRIBUTION LOGIC

110

SPLITTER
POOL

SPLITTER
POOL

SPLITTER
POOL

LOCAL LOAD BALANCER

LOCAL LOAD BALANCER

LOCAL LOAD BALANCER

PUBLIC
INTERNET

CLIENT

CLIENT

CLIENT

CLIENT

CLIENT

CLIENT

CLIENT

FINGERPRINT
BLOCK
VALIDATOR

122

104

FIG. 1

TITLE: AUTOMATED CONTENT INTEGRITY VALIDATION FOR STREAMING DATA
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2/6

FIG. 2

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APPLICATION NO.: 10/038,023

3/6

FIG. 3

TITLE: AUTOMATED CONTENT INTEGRITY VALIDATION FOR STREAMING DATA
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4/6

CLIENT REQUESTS A DATA STREAM
FROM A SERVER ⟶ 402

SERVER SAMPLES THE DATA STREAM
AND GENERATES ONE OR MORE
FINGERPRINT BLOCKS FOR ONE OR
MORE SAMPLED PORTIONS OF THE
DATA STREAM AT THE SERVER ⟶ 404

SERVER SENDS THE DATA STREAM TO
THE CLIENT ⟶ 406

CLIENT OBTAINS ONE OR MORE
FINGERPRINT BLOCKS GENERATED AT
THE SERVER ⟶ 408

CLIENT RECEIVES THE DATA STREAM ⟶ 410

CLIENT SAMPLES THE DATA STREAM
AND GENERATES ONE OR MORE
FINGERPRINT BLOCKS FOR ONE OR
MORE SAMPLED PORTIONS OF THE
DATA STREAM AT THE CLIENT ⟶ 412

CLIENT COMPARES ONE OR MORE
FINGERPRINT BLOCKS GENERATED AT
THE CLIENT TO ONE OR MORE
FINGERPRINT BLOCKS GENERATED AT
THE SERVER ⟶ 414

DO THE COMPARED
FINGERPRINT
BLOCKS MATCH? ⟶ 416

NO ⟶ GENERATE AN ERROR MESSAGE
AT THE CLIENT ⟶ 420

COMMUNICATE AN ERROR
MESSAGE TO THE SERVER ⟶ 422

YES

COMMUNICATE A VALID STATUS
MESSAGE TO THE SERVER AND
CONTINUE ⟶ 418

400

FIG. 4

TITLE: AUTOMATED CONTENT INTEGRITY VALIDATION FOR STREAMING DATA
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APPLICATION NO.: 10/038,023

5/6

500

• • • < 00:00:00:00.0 > < 00:00:04:00.0 > < FA923AB1xH > • • •

BEGINNING
TIMESTAMP

ENDING
TIMESTAMP

FINGERPRINT
BLOCK

FIG. 5

TITLE: AUTOMATED CONTENT INTEGRITY VALIDATION FOR STREAMING DATA
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6/6

600

CLIENT REQUESTS A DATA STREAM
FROM A SERVER — 602

SERVER SAMPLES THE DATA STREAM
AND GENERATES ONE OR MORE
FINGERPRINT BLOCKS FOR ONE OR
MORE SAMPLED PORTIONS OF THE
DATA STREAM AT THE SERVER — 604

SERVER SENDS THE DATA STREAM TO
THE CLIENT — 606

CLIENT OBTAINS THE FINGERPRINT
BLOCKS GENERATED AT THE SERVER — 608

CLIENT RECEIVES THE DATA STREAM — 610

CLIENT SAMPLES THE DATA STREAM
AND GENERATES ONE OR MORE
FINGERPRINT BLOCKS FOR ONE OR
MORE SAMPLED PORTIONS OF THE
DATA STREAM AT THE CLIENT — 612

CLIENT COMPARES ONE OR MORE
FINGERPRINT BLOCKS GENERATED AT
THE CLIENT TO ONE OR MORE
FINGERPRINT BLOCKS GENERATED AT
THE SERVER — 614

DO A THRESHOLD
PERCENTAGE OF THE COMPARED
FINGERPRINT BLOCKS
MATCH? — 616

NO → GENERATE AN ERROR MESSAGE
AT THE CLIENT — 620

COMMUNICATE AN ERROR
MESSAGE TO THE SERVER — 622

YES

COMMUNICATE A VALID STATUS
MESSAGE TO THE SERVER AND
CONTINUE — 618

FIG. 6